

VS-VSMD400AW60, VS-VSMD400CW60

Vishay Semiconductors

Standard Recovery Diodes, 400 A



PRIMARY CHARACTERISTICS						
I _{F(AV)} per module	400 A					
Туре	Modules - diode, high voltage					
Package	TO-244					
Circuit configuration	Two diodes common anode, two diodes common cathode					

FEATURES

- Standard rectifier
- Popular series for rough service



- Cathode and anode to base available
- UL approved file E222165
- · Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

- Welders
- · Power supplies
- Motor controls
- · Battery chargers
- General industrial current rectification

MAJOR RATINGS AND CHARACTERISTICS							
SYMBOL	CHARACTERISTICS	VALUES	UNITS				
I		400	Α				
I _{F(AV)}	T _C	133	°C				
I _{F(RMS)}		628					
I _{FSM}	50 Hz	2500	Α				
	60 Hz	2620					
I ² t	50 Hz	31	kA ² s				
1-1	60 Hz	28	KA-S				
I ² √t		312	kA ² √s				
V _{RRM}		600	V				
T_{Stg}, T_{J}		-40 to +175	°C				

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS								
TYPE NUMBER	VOLTAGE CODE	V _{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V _{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I _{RRM} MAXIMUM AT T _J = 175 °C mA				
VS-VSMD400.W60	60	600	700	12				

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FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at case temperature per leg	I _{F(AV)}	180° conduction, half sine wave, 133 °C			200	Α
Maximum RMS forward current per leg	I _{F(RMS)}	DC at 137 °	C case tempera	ature	314	
		t = 10 ms	No voltage		2500	
Maximum peak, one-cycle forward,		t = 8.3 ms	reapplied		2620	Α
non-repetitive surge current per leg	I _{FSM}	t = 10 ms	100 % V _{RRM}		2100	
		t = 8.3 ms	reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	2200	
Manifestore 124 for the inner and the	l ² t	t = 10 ms	No voltage		32	kA ² s
		t = 8.3 ms	reapplied		29	
Maximum I ² t for fusing per leg		t = 10 ms	100 % V _{RRM}		22	
		t = 8.3 ms	reapplied		20	
Maximum l ² √t for fusing per leg	I²√t	t = 0.1 ms t	o 10 ms, no vol	tage reapplied	311	kA²√s
Low level value of threshold voltage per leg	V _{F(TO)1}	(16.7 % x π x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			0.73	V
High level value of threshold voltage per leg	V _{F(TO)2}	$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$			0.85	V
Low level value of forward slope resistance per leg	r _{f1}	(16.7 % x π x I _{F(AV)} < I < π x I _{F(AV)}), T _J = T _J maximum			1.52	mΩ
High level value of forward slope resistance per leg	r _{f2}	$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum} $ 1.36			1115.2	
Maximum forward voltage drop per leg	V_{FM}	$I_{FM} = 200 \text{ A}, T_J = 25 \text{ °C}, t_p = 400 \text{ µs square wave}$ 1.31			V	

BLOCKING							
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS			
Maximum peak reverse leakage current per		T _J = 175 °C	12	mA			
leg	IRRM	$T_J = 25 ^{\circ}C$	200	μΑ			

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL		UNITS		
PARAMETER	STIVIBUL	MIN.	TYP.	MAX.	UNITS
Thermal resistance, per leg	0	-	-	0.10	
junction to case per module	R _{thJC}	-	-	0.05	°C/W
Thermal resistance, case to heatsink per module	R _{thCS}	-	0.10	-	
Woight		-	68	-	g
Weight		-	2.4	-	oz.
Mounting torque		30 (3.4)	-	40 (4.6)	Un f in
Mounting torque center hole		12 (1.4)	-	18 (2.1)	lbf · in (N · m)
Terminal torque		30 (3.4)	-	40 (4.6)	(((' (((((((((((((((((
Vertical pull		=	-	80	lbf ⋅ in
2" lever pull		-	-	35	IDI · III
Case style			TO-244		

△R CONDUCTION PER JUNCTION											
DEVICES	SI	NE HALF	WAVE CO	NDUCTIO	N	RECTANGULAR WAVE CONDUCTION				UNITS	
DEVICES	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	UNITS
VSMD400.W60	0.041	0.047	0.060	0.084	0.131	0.029	0.049	0.064	0.087	0.132	°C/W

Note

• Table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC





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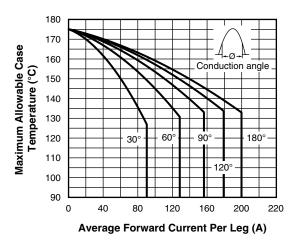


Fig. 1 - Current Ratings Characteristics Per Leg

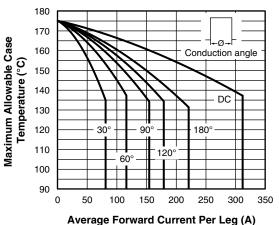
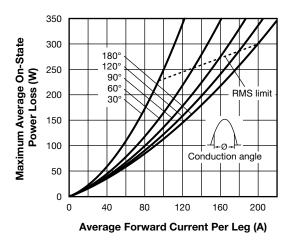


Fig. 2 - Current Ratings Characteristics Per Leg



2500 2300 2100 Peak Half Sine Wave Forward Current (A) 1900 60 Hz 0.0083 s 1700 50 Hz 0.0100 s 1500 1300 1100 900 700 500 100 **Number of Equal Amplitude Half**

Cycle Current Pulses (N)
Fig. 3 - Maximum Non-Repetitive Surge Current Per Leg

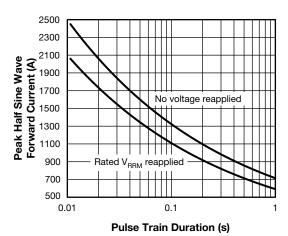


Fig. 4 - Maximum Non-Repetitive Surge Current Per Leg

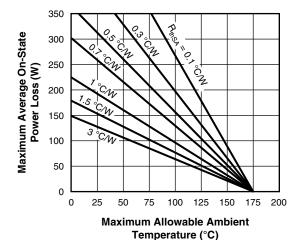
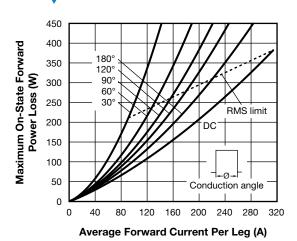


Fig. 5 - Forward Power Loss Characteristics



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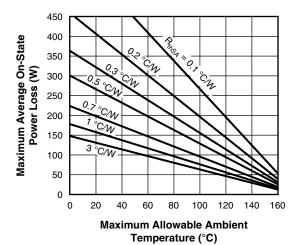


Fig. 6 - Forward Power Loss Characteristics

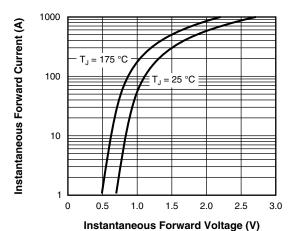


Fig. 7 - Forward Voltage Drop Characteristics Per Leg

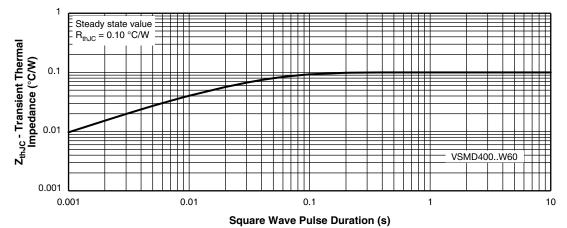
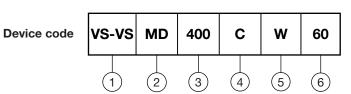


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics Per Leg

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ORDERING INFORMATION TABLE



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MD = standard recovery diode

3 - Current rating (400 = 400 A)

Circuit configuration:

• C = two diodes common cathode

• A = two diodes common anode

5 - Type of device:

W = TO-244 not isolated

6 - Voltage rating (60 = 600 V)

CIRCUIT DESCRIPTION	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Гwo diodes common anode	A	Lug Lug terminal cathode 1 cathode 2
wo diodes common cathode	С	Lug Lug terminal terminal anode 1 anode 2

LINKS TO RELAT	TED DOCUMENTS
Dimensions	www.vishay.com/doc?95021



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